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Combat Crew

Strategic Air Command

March 1984

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SAC's 38th Anniversary

Flying in Weather—

When Mother Nature talks, flyers listen. She is a great teacher. However, the training aids she uses — loud noises and flashing lights — can be hazardous to your health. Why does she need to go to such drastic measures to get our attention? Why can't we remember? Why can't we learn from others? Combat Crew recently spoke to Lt Gen Miller about his early flying experiences and some of the lessons Mother Nature taught him — Editor

GOONEY BIRDS — I learned a lot . . . When I graduated from flying training in 1954, I really wanted to be a fighter pilot, but the Air Force had other plans and sent me off to fly C-47s, the Gooney Birds. That did not seem to promise much excitement.

I was attached to the 6th Army on the West Coast. Ferrying the 6th Army staff and USO shows from one grass strip or dry lake bed to another did not seem to be much of a challenge, but it couldn't have worked out better in my estimation.

I thought I was as good as anybody else at flying instruments when I came out of pilot training, but that isn't very good; it takes experience to become a good instrument pilot.

I had the opportunity for a year and a half to fly those Gooney Birds, in weather, with people who had 5000 to 6000 hours in the airplane — and I learned a lot just from watching and listening to them. There was no alternative but to fly in weather since we had no oxygen and had to operate below 10,000 feet. During certain seasons of the year, we seemed to be in weather all the time. We would get into it at 200 feet and stay in it for the whole trip.

Every flight seemed to end with an instrument approach. I was always delighted when I could get a GCA because I did not have much faith in the ILS equipment. It wasn't long after, that the ILS became the standard approach and we used the GCA for backup. But practically every flight was an instrument flight, hand flown since the autopilot, if we were lucky enough to have one, was a rudimentary and unreliable device at best.

Since airplanes were unpressurized they tended to leak a lot when it rained. We wore raincoats and garrison cap covers on our heads to keep dry while flying. While it was not the most comfortable experience, that year and a half I spent in the Gooney Bird was probably the most valuable flying experience I have had in the Air Force. That experience has saved my life several times since then.

One vivid experience that I will never forget occurred when I was stationed on the upper peninsula of Michigan having finally become a fighter pilot. I maintained my currency in the Gooney Bird and was on a cross country to Florida. It was summer time and we were taking off from Florida when we got into the bottom of a thunderstorm. I never had a Gooney Bird in a thunderstorm before, and I guarantee I never got in one after that. As we were sucked up in this thing the vertical velocity indicator was pegged even though the copilot and I were holding the yoke all the way forward. I had retarded the throttles to idle, but the airspeed still indicated 220 miles an hour. We were climbing at over 5000 fpm — none of which made any sense — I didn't understand it — it didn't compute; the only thing I could do was just try to hold the wings level. Anyway we were thrown out of the top about 14,000 feet which was bordering on the max altitude for the old Goon. That one experience gave me great respect for thunderstorms. I am a firm believer in staying away from those thunder-bumpers.

I have since learned that a thunderstorm discharges about the same amount of energy as the atomic bomb that destroyed Nagasaki. Certainly no sane crew would knowingly fly into a thunderstorm — would they?

Flying instruments is a lot like playing golf — you do well if you are confident. You have to have confidence, and the only way you can develop that confidence is to hone your ability as well as you can, understand the procedures thoroughly and continually practice. If you do those kinds of things you will become a very proficient instrument pilot.

Get Home-Itis. I never have been in such a situation because I've always been cautious about pressing on when I knew the odds were against it. If you want to

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be a good instrument pilot you have to mature and to mature you have to live, so there isn't much point in pressing on if you know you can't get to your destination.

The incident with the thunderstorm was a very valuable experience for me; fortunately I got out of that thing without getting hurt or bending the airplane. You've heard stories like that. But you don't develop a real appreciation for something like that until you find yourself in such a situation. If you do you will never forget it. It's one of those things that stays with you forever. I've never suffered from get home-itis — not that I don't like my home, I do, but the fact that I like it so much causes me to think again before I make that final leg home when common sense tells me that I probably shouldn't.

Understand Your Capabilities and Limitations. You have to understand your own capabilities and limitations and not allow yourself to be pushed into doing something knowing you are not capable. Regulations are written as pretty good guidelines, and they are written to cover a general population of people. Some people are capable of flying in conditions that are considerably less than the minimums that we prescribe — other people can't hack the minimums; each of us knows our capabilities which, by the way, are not constantly the same. While we have differing minimums depending upon the mission priority, the aircraft commander has to actually look at himself and his capabilities. I'm authorized to go now; am I capable of going? Don't let your pride get in the way of your capabilities. Too many people have pride engraved on their tombstones. You have to understand your own capabilities; it's that simple.

Equipment: Then and Now. Instrument flying has always been a real challenge. We have advanced from the radio range to INS and soon we'll have the global positioning system (GPS). The first instrument approaches I flew were principally ADF. That ADF needle tended to home better on thunderstorms than on the station. That characteristic tended to further detract from what was already less than a precise approach. We tried to get a reasonably good fix before we started the inbound leg, flew a heading, let down to minimums and then we'd fly out our time. Exciting. What a luxury it is to fly an ILS with a GCA backup and have command bars leading the way. Maybe that's one of the reasons I enjoy instrument flying more and more — it's getting easier, more reliable and more precise.

Lt Gen George D. Miller
Vice Commander in Chief, SAC

Today's equipment is excellent. The ground stations are very good and the instrumentation in our aircraft is an electronic marvel. The microwave landing system (MLS) will be a significant improvement over the ILS. By combining the GPS and MLS we should have the capability of depicting a three dimensional approach in the cockpit. Who knows what other **Buck Rogers** ideas will soon become standard Air Force hardware?

Good Luck! Fly Safe! ★ ★ ★

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“IT DON’

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It sure looked good on paper. “Banker’s hours,” the Nav said. We were scheduled for a 9:00 a.m. showtime and an 1145 takeoff for an eight hour flight. The profile was routine: refueling direct to low level at Hastings with two racetracks, and a Nav leg home. We finished the briefing and everyone headed for home.

The following morning spirits were high as the bus left the squadron. This was the pilot team’s last flight prior to their annual check ride and everyone wanted to have a good day. “Life Support,” the pilot told the bus driver, and we were on our way. A quick stop and we headed for Base-Ops.

The weather briefing didn’t sound good. Thunderstorms and severe turbulence were forecast. “The route has been closed until 2000 Zulu,” the weather forecaster announced halfway through the briefing. “Here we go again,” said the Radar.

We were sitting in the Base Ops lounge going over paperwork when a call came from the Command Post. The pilot returned with a sour look on his face. “Well guys, we have an aircraft change.” The copilot moaned. “The fire department was using our plane for rescue practice this weekend and put a hole in the fuselage with a crash axe. They’re preflighting our new plane now. Command Post said to standby.” The copilot grumbled as he began working new takeoff data and a new Form F.

An hour later Command Post called again to say our plane was ready. As we climbed on the bus, it was obvious that enthusiasm was declining.

“We haven’t finished the pre-flight yet, sir,” the crew chief said as he climbed on the bus. Everybody moaned. “Should be about ten or fifteen minutes.”

When we finished reviewing the 781 the pilot suggested that we get as much of our pre-flight done as possible. Everyone had just finished when Command Post called again. Since the route was closed for weather, scheduling was trying to buy us a new entry time. Before we went back to Base Ops, the pilot called the tanker to tell them we wouldn’t be making our second scheduled takeoff.

“No problem,” the Nav said as he began working with the new times. We had long since passed the point where our racetrack times were of any use. The pilot called Command Post to give them our requested entry time. We were told to go back to the plane. Scheduling would buy us new release times after we had engines running. Our crew motto came to mind as we climbed back on the bus: “It don’t get no better than this.”

T GET NO BETTER THAN THIS!”

After engine start, everyone was checking systems when the Nav noticed that the J-4 heading system wasn't working. He asked the pilot to call maintenance. They showed up in record time and found the problem. We were almost ready to taxi.

“Pilot,” the Nav wailed this time, “my 0-32 camera isn't working! We'll need maintenance again.” The pilot called Command Post and requested that a maintenance truck meet us at the hammerhead. Command Post told us to hold our position.

By the time maintenance had arrived, the Nav found the problem. There were no fuses in the camera. The Radar dug through his bag and found two spares just as the maintenance troop opened the hatch. Never mind!!!

“Chief, clear the aircraft for taxi,” the pilot announced. “Roger,” he answered. “Have a good flight sir.” Finally, after a two hour and forty-five minute delay, we crossed the hold line.

Morale was sinking fast. We had spent the better part of the morning running back and forth between the plane and Base Ops, recomputing takeoff data and timing sheets somewhere in between, and still had eight hours of flying to do (The next time someone from CBPO tells me they hate their job and flyers have all the fun, I won't be held responsible for my actions).

Refueling went smoothly. Shortly thereafter we lost doppler Radar. “Pilot,” the Nav said, trying to remain calm, “since the doppler is out we won't have an AJN-8 heading system for much longer.” We were flying at thirty-three thousand feet. Morale was at twenty thousand feet and sinking fast.

The copilot called over the interphone. “EW, I'll need to get low level weather in a few. Hustle with the Defensive Coordination Exercise (DCE).” “Roger,” I answered as I prepared to call center. The drop was OK'ed and in five minutes the gunner and I were complete. “You can have radio two now,” I said. I heard the copilot make the call. There was no answer. After several minutes we nearly gave up. We tried everything from a phone patch to asking Center to give the party a call on a land line. Finally Offutt metro answered.

“That's right sir,” the weather man said. “The primary entry point is still closed.”

“Well crew,” said the copilot, “looks like we go alternate entry.”

The Nav scrambled to come up with new times. The copilot scrambled to refile our flight plan, and I scrambled to the oven to warm up dinner. I needed something to eat before this low level!

Needless to say, the rest is history. We were the first plane through after the route reopened. The way things were going, I didn't feel comfortable with our predicament.

“We were losing equipment left and right and the Radar was too busy dodging thunderstorms to worry much about dropping bombs.”

We were losing equipment left and right and the Radar was too busy dodging thunderstorms to worry much about dropping bombs. On our first run across the bomb site, we were forced to abort the route for thunderstorms at the end maneuver area. I breathed a sigh of relief during climbout as I relayed the low level weather report. The route was closed again with no consulation to anyone on the crew.

“Well guys, we didn't accomplish much today,” the pilot said. “Just a lot of flailing around.”

“It's time to start the Nav leg crew,” said the Navigator. “EW, would you put the sextant in please.

I moaned. I think that all EW's hate to shoot cel. Uh oh! The sextant mount was frozen shut. “Nav, we have a slight problem,” I said. After thawing out the sextant port with the altus lamp, the Nav leg came off without a hitch. Another hour and we'll be on the ground. Maybe things aren't so bad after all.

What! Fly out our scheduled timing? They must really be kidding. With no IP on board? An hour in the pattern shooting low approaches! What an appropriate end to this day.

It took an hour at maintenance debrief to cover all the write-ups in the 781, and a half hour for the crew to drink a beer and talk about the day's events. It had sure been a long one. And everyone was glad that we didn't have days like this too often. The consensus was that while it wasn't a “picture perfect” flight, it had been moderately successful — due mostly to the professionalism and motivation of the crew.

“See you all in a few hours,” I said as I started to leave the Squadron. We were mission planning for another flight the next day.

“Hey Nav, what's this flight gonna be like?” asked the gunner.

“Banker's hours,” said the Nav. “Banker's hours.”

The preceding story is true. And I'm sure that every reader has a similar one to tell. There are going to be days when you run over your dog leaving the house, get a speeding ticket coming to base, and hit the squadron commander's car in the parking lot. But you still have to fly. And whether you have your mind on flying or not may mean the difference between life and death, or worse yet, a Qual Level 3 if Stan Eval comes along.

Motivation is a problem in a job where there is repetition. Although there are a lot of variables, flying can still be repetitious. I won't offer advice for this problem. That job is above my pay scale. But I will say the biggest factor is the individual. If you motivate yourself, that motivation will manifest itself in others.

Remember there are people out there who are ''land-locked'' in their jobs and never get to ''slip the surly bonds of earth.''

REVERSE GEAR

Old man winter sure has been hard on SAC aircraft the past few months. The Christmas holiday weekend in particular stands out as one of the worst on record as minus zero temperatures combined with strong winds blanketed most of the continental United States. What happened at one SAC base over that period, however, never should have occurred.

Because of extreme cold, deicing had to be terminated on Friday. Deicing fluid was freezing on the wings. On Saturday and Sunday, there was no outside work because of -70 degrees wind chill with blowing snow.

In fact, blowing snow covered the aircraft wings and froze flight controls, thus degrading several alert aircraft. The temperature on Monday was forecast to go above zero with moderate 12 knot winds. However, freezing rain was forecast for Monday night.

Given this relative break in the weather, an intense effort of snow removal and alert aircraft deicing began at 0600 to return the alert aircraft to EWO capability. Crew chiefs began work after their 0800 briefing with some nonalert augmentees provided. By 1530, the snow had been removed from the alert ramp and despite some snow on the aircraft, all were EWO capable.

Due to the forecast of freezing rain, the senior maintenance supervisor ordered removal of the remaining ice and snow from the aircraft.

The number of deicing trucks available had been severely reduced by near constant use and extremely cold temperatures over the previous five days. There were only three deicing trucks operational on Monday and they were experiencing breakdowns that often left only one or two in operation at any one time.

The crew chiefs were augmented by nonalert personnel during the day and at 1900 nine new replacements arrived. A replacement for the alert maintenance controller also came on duty at this time and crew chiefs remained on duty with occasional breaks to warm up and eat.

At approximately 2330 a crew chief was given a fully serviced deicing truck and two young assistants. The crew chief was told to keep the throttle at 2000 rpm while the truck was operating to charge the battery since the cold weather had drained the battery to the point where it had not started earlier in the day. Although both as-

. . . "BOOM"

Thanks to:
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sistants and the crew chief had been qualified to operate the deicing boom, none had formal documentation authorizing them to drive the truck. The crew chief had prior informal training and had driven a deicing truck earlier in the day.

The crew chief accepted the truck and proceeded to the aircraft. The outboard left wing was deiced with no problems and the truck was then repositioned to start on the inboard left wing and fuselage. The assistants acted as spotters, with one behind the truck and the other at the driver's door to relay instructions. Wheel chocks, although used earlier were not prepositioned during backing. When the crew chief stopped the truck, he pushed the floor mounted automatic transmission forward, thinking it was in park. It was actually put into reverse at the full forward position. Interior cab lights were inadequate to visually confirm the gear selector position. He set the parking brake and adjusted the throttle for 2000 rpm. Upon seeing the reverse lights illuminate, both spotters began to yell, but the driver did not hear them over the noise from the engine.

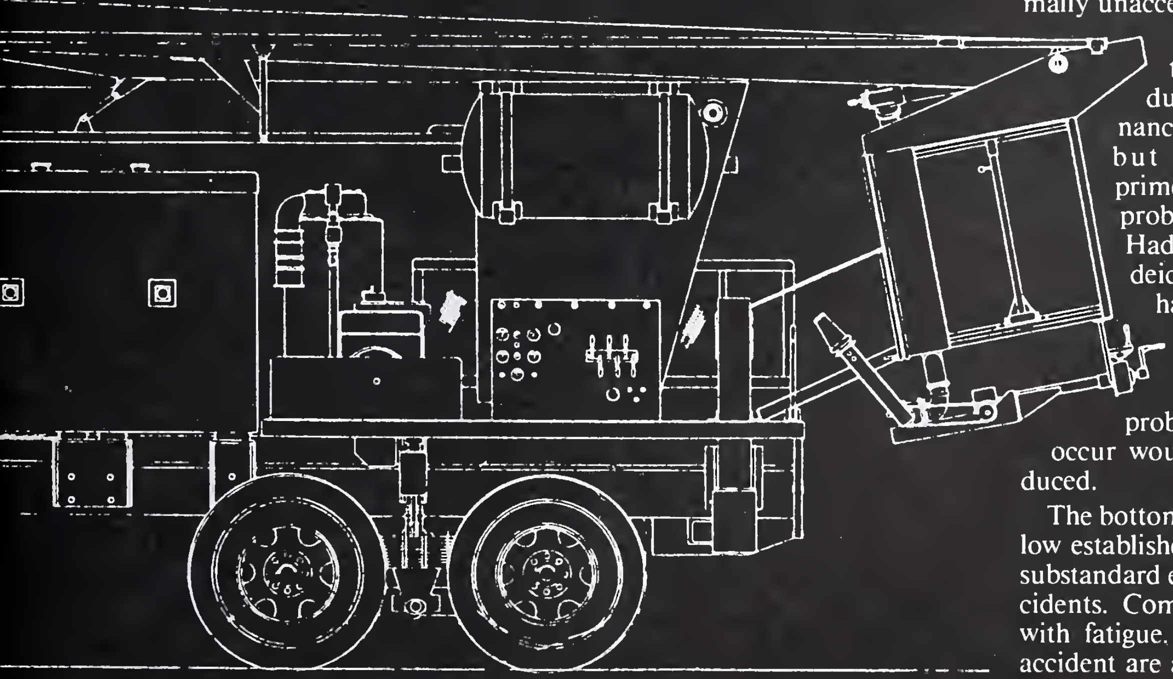
When the driver felt the truck moving, he stepped on the brakes, but it was too late. The high rpm in reverse gear caused the truck to override the parking brake and the deicing boom struck the aircraft wing, producing one dent and one hole in the skin of the leading edge left wing. Total cost of repair: $970.00.

At the time of the mishap, the crew chief had been on duty 16 hours and 45 minutes. Wind chill during his duty period ranged from −30 degrees at 0800 to 10 degrees at the time of the incident.

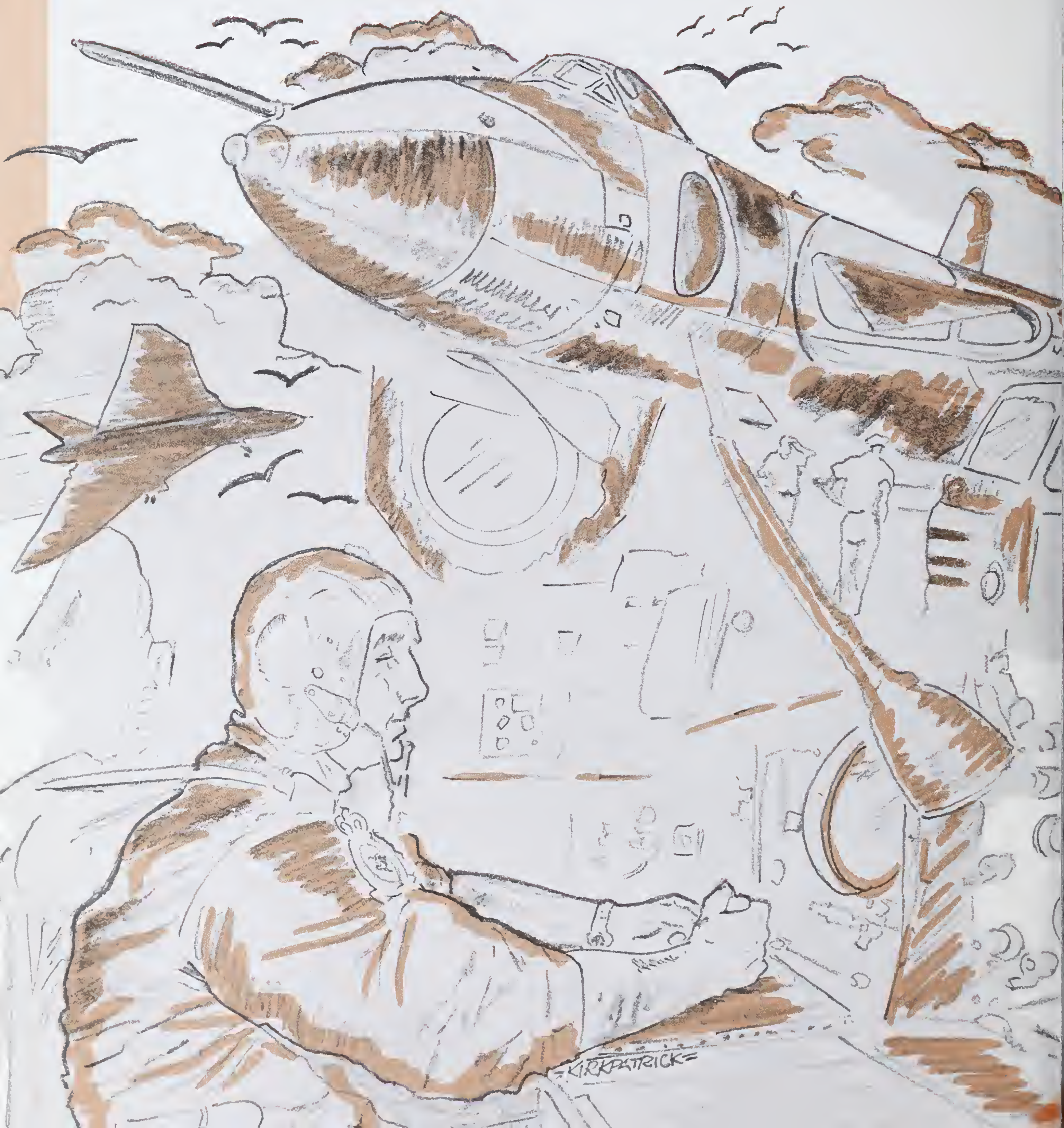
What lessons can be learned from this accident? Deicing of alert aircraft to EWO capable status is necessarily a high priority task which must be pursued vigorously until an EWO capability is restored. Implicit in this is the absolute need to follow existing tech order guidance and provide active and involved supervision. Cold temperatures, long duty hours and degraded equipment combined with ineffective supervision set the stage for this incident. Line chiefs and crew chiefs — because they were on alert — were required to work for more than 16 hours with only occasional relief. The hazard is that long hours often lead to lapses in judgment and willingness to use normally unacceptable shortcuts.

Certainly there are times when extending duty time for alert maintenance personnel is essential, but supervision must be primed and alert for potential problems caused by fatigue. Had procedures for chocking deicing vehicles been used, had the vehicle been fully operational, and if the driver had been more alert and rested, the probability for this incident to occur would have been greatly reduced.

The bottom line is that failure to follow established procedures and use of substandard equipment can lead to accidents. Combine these three factors with fatigue, and the chances for an accident are almost assured.



BIRD STRIKE



- How Serious?

Sq Ldr Mike Macartney, BSc RAF
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The incident involving a KC-135A birdstrike at Sacramento Metropolitan Airport on 15 December 1983 highlighted again the need for crews to be cautious when they have a known or suspected birdstrike. Personal experience has made me very aware of the damage birds can do even though all systems appear to be functioning normally. Let me share my experience with you.

I was the aircraft commander of a Vulcan bomber on a routine low level training sortie. We had been at low level for about 30 minutes and the AEO (Air Electronics Operator) had mentioned on several occasions that he could see a lot of birds through his periscope, (the AEO had a periscope through which he could see the upper and lower surfaces of the aircraft and surrounding area). He wondered whether we should start the APU to provide electrical power, in the event that we lost an engine driven generator due to birdstrike damage. I didn't think there was a high birdstrike potential and declined his offer of the APU. Suddenly there was a loud "bang." "What was that?" I said. "Birdstrike," replied one of my crewmembers. We carried out emergency drills and climbed to 1800′ AGL. I decided not to climb higher because the emergency drill called for tripping the nonessential electrics and the ceiling was 1900′ feet. I scanned the engines and systems, and all appeared normal. The AEO looked at the top and bottom surfaces of the aircraft and could see no damage. Without any obvious damage it would seem logical to complete the mission and return to home base some 250 miles away. However, our regulations stated, "That in the event of a birdstrike, the aircraft was to be landed at the nearest suitable airfield."

I made my decision to land at RAF Stornaway in NW Scotland. This base was 35 miles from where the incident took place and is probably the most remote RAF base in the United Kingdom. The base has one 6000′ runway but this didn't appear to be any problem since I had previously been checked out for landing on short runways. However, I soon realized that the landing would be anything but routine. The aircraft was 20,000 pounds heavier than recommended for a short runway and there was a 15 kt crosswind (Vulcan limit for a 6000′ runway). The excess weight would mean a higher threshold speed and the crosswind could produce problems when the brake parachute was streamed on landing. In my mind I wondered if we should divert to another base. However, landing was completed with runway to spare and we taxied to the ramp. Initial examination of the aircraft revealed a two foot square hole in the starboard wing directly above numbers three and four engines. Further examination revealed damage to the engines requiring one of them to be replaced. I was pleased I had made the right decision. To have continued to home base may have resulted in *further engine damage, engine loss, fire, more serious structural damage and possibly the loss of a valuable asset.* The bird we had hit was a five and one-half pound Cormorant.

I fully appreciate the logistical nightmare that would ensue, if each USAF aircraft suffering a birdstrike were to divert to the nearest suitable airfield. However, perhaps we could redefine **suitable** as being the nearest base operating similar type aircraft. It could save us valuable aircraft and more importantly aircrew lives.

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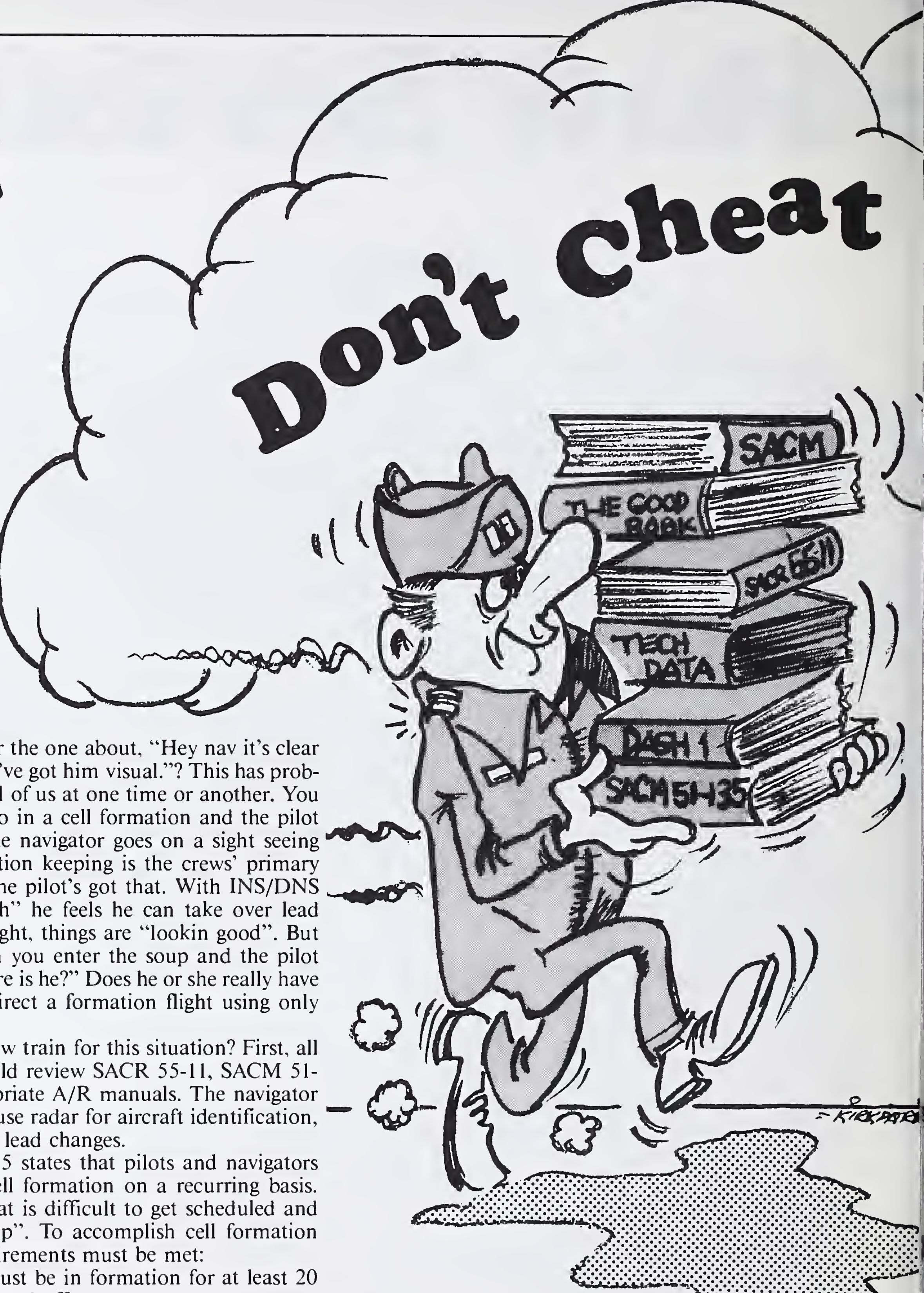
Don't Cheat

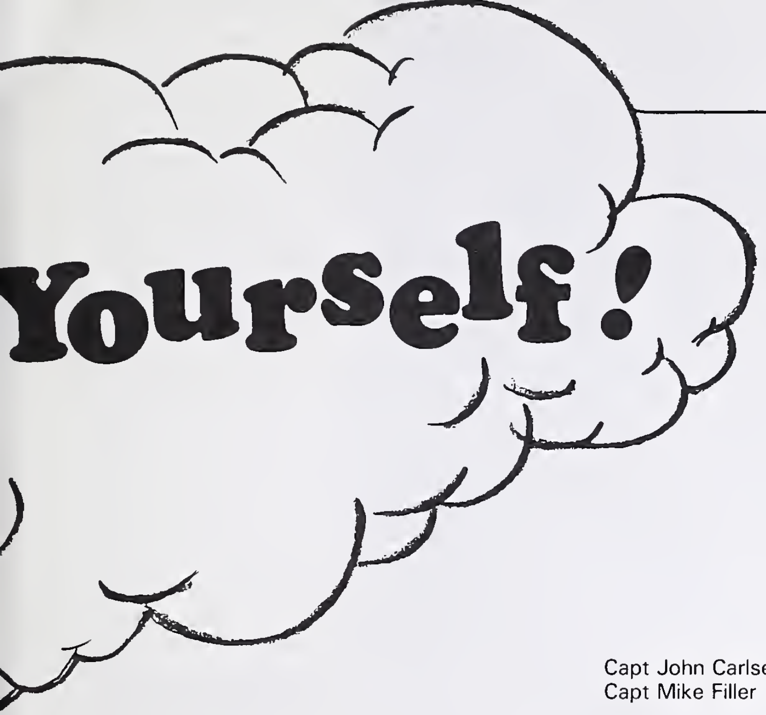


Did you ever hear the one about, "Hey nav it's clear and a million, I've got him visual."? This has probably happened to all of us at one time or another. You take off number two in a cell formation and the pilot flies it visual. So the navigator goes on a sight seeing tour. He knows station keeping is the crews' primary responsibility and the pilot's got that. With INS/DNS as a backup "crutch" he feels he can take over lead anytime. On this flight, things are "lookin good". But what happens when you enter the soup and the pilot says, "Hey nav, where is he?" Does he or she really have the experience to direct a formation flight using only radar?

How should a crew train for this situation? First, all crew members should review SACR 55-11, SACM 51-135, and the appropriate A/R manuals. The navigator must know how to use radar for aircraft identification, station keeping and lead changes.

The SACM 51-135 states that pilots and navigators must accomplish cell formation on a recurring basis. This is one item that is difficult to get scheduled and easy to "pencil whip". To accomplish cell formation training, three requirements must be met:

1. The aircraft must be in formation for at least 20 minutes after level off.
2. Exchange lead once — the time in each position should be divided equally.
3. A planned heading change of at least 30 degrees for each cell leader.



Yourself!

Capt John Carlsen
Capt Mike Filler

SACR 55-11 also states that the primary means of station keeping is the APN-59 radar. The secondary means is A/A TACAN and UHF/DF. Armed with this information, the navigator should "run the show" on any formation flight.

What is the best way to set up the radar? We'll give you some of our techniques. They work well for us and are simple to use. Prior to take off, set the range to 3-30/5 and adjust the scope to present 15 NM. Set the tilt to +6, place the antenna pattern to PENCIL, and the scope reference to REL. It is best to select BEACON for initial identification. This technique enables you to quickly determine lead's bearing and distance without interference from ground clutter. Leads exact position becomes very critical when entering the clouds immediately after take off. When giving distance calls in BEACON mode it is important to remember the radar system needs extra time to process a beacon signal. The beacon reply is delayed approximately 0.34 NM. This means that an aircraft is actually 1/3 NM closer than you think.

After the gear and flaps are up and positive identification has been established, it is desirable to skin paint the lead aircraft. Skin painting gives you the most accurate presentation of lead's position. The proper time to switch from beacon to skin paint is a variable that changes with every mission. The most important point to remember is that separation must be maintained, and radar contact will be temporarily lost during the change. To set the radar up for skin painting, leave the radar in REL, put the antenna pattern to FAN, and place the function switch to SEARCH. Local variation is set in the HDG SEL, range is changed to 2-30/1.

We use this technique because it allows us to quickly take a radar fix. In less than twenty seconds you can go to STAB, select 50/10, and be ready to fix. After cross-checking the INS and DNS, go back to station keeping. This technique allows you to maintain integrity within the cell, plus monitor aircraft position and the accuracy of the INS and DNS.

Crew coordination during station keeping is also a skill that needs to be sharpened through practice. If the pilot has visual contact with lead, the navigator need only give range calls until the pilot can "calibrate" his eye. When visual contact is totally lost, range and bearing, plus relative movement, must be included into the nav's calls.

Once the departure and station keeping are under control, you can begin preparing for the lead change. SACR 55-11 and the various air refueling manuals give detailed information about lead-change procedures. Pilots, let your navigators aid in lead changes to the maximum extent possible. The nav should direct all movement using radar. Let them see what happens during the lead swap and remember the crew is training for the day when the weather is very poor and radar is the only means available to accomplish the lead change. The pilot's respect and confidence in the navigator is paramount. If you don't practice this procedure as a crew, you will be unable to perform it when you need it the most.

Don't cheat yourself. Let the navigator do his/her job and gain the proficiency that is critically needed when the weather is bad and visibility is limited.

FLY THE AIRCRAFT!!!

Capt Kim L. Zetterberg
904 AREFS, Mather AFB

Flying Proficiency — Whose Respo

Ah, Monday morning and time once again for the weekly visit to scheduling for a preview of coming attractions. Hey, what happened to that sortie we had for next week? And where did we get those four more days of alert from? Who are all these new guys on the schedule? Maybe this is a dream and this isn't even our schedule at all!

Sound familiar? It probably does to anyone who has been around a Strategic Air Command flying unit for more than a couple of months. Flying time allocated by Congress has been decreasing steadily since the Vietnam conflict accompanied by a decline in the experience level of our flying personnel. To make matters worse our aircraft are starting to break down more frequently as twenty-five year old parts begin to fail. Many observers continue to question whether or not we can still get the job done safely. To date we have been able to answer this question positively, but tomorrow's response will depend more and more on our ability to provide adequate training for our aircrews utilizing perhaps even more limited resources.

Strategic Air Command training requirements are heavily driven by regulation. The SACM 51-135 series and other associated directives provide all levels of aircrew training management with a substantial amount of guidance concerning courses of training available for different proficiency levels and methods and procedures for the accomplishment of the same. These requirements are further supplemented by the Numbered Air Forces and even our own wings and individual squadrons. Please note that all of these requirements are **minimum** requirements, and that you, the crew member, are the only person who really knows what your needs are for attaining/retaining your proficiency goals.

At this point you are probably beginning to get a bit skeptical. After all, who as an individual crew dog can hope to get specially tailored training when it seems the "higher-ups" have already decreed what has been, what is, and what will be? Not to fear, your aircraft commander holds the key to your success. Chapter One of SACM 51-135, Vol. I, makes him ultimately responsible for the quality of all training accomplished by the entire crew. So where do we start now that we know that we have the necessary firepower to get the training we need?

A crew meeting prior to the onset of each new quarter is a great beginning. Take the time to discuss potential weak areas, desired upgrades and objectives, and the type of missions most suitable to meeting crew needs. Put together a rough crew schedule of alert tours, TDY's, and leaves (usually pretty firm and unchanging events) to get a better idea of where simulators, physicals, flights, and extra duty responsibilities will fit in. This schedule becomes your aircraft commander's "shopping list" when he goes in to consolidate your training requirements. Be sure to include requests for those missed pilot pros, PAR's, and night navigation legs that weren't accomplished last quarter. Remember that it is the squeaky wheel that gets the grease — ask for everything you need!

Your aircraft commander, if he's worth his salt at all, spends a great deal of time reviewing the squadron "game plan" for the upcoming year with the operation's officer and/or squadron commander. This enables everyone concerned to get a better idea of who will be on the squadron upgrade lists, of potential TDY changes, and of any impending crew changes. Any of these events can easily unbalance even the best crew training plan if they come as a surprise. Review and approval of the suggested game plan should be a relatively simple and routine procedure if the squadron "master plan" is considered beforehand.

Once the crew training plan has been approved it's time to work out the details. An aircraft commander should work closely with his schedulers, operations officer, training flight personnel, and even the Stan/Eval folks in transferring the plan from paper into action. Sorties that go to print for the quarter should completely cover the basic command and wing requirements as a minimum. It wouldn't reflect intelligent planning, for example, to expect a crew to accomplish night navigation legs and landings with only a selection of day missions (never happens does it?). All these potential stumbling blocks are corrected at this stage of the game, and other special requirements and training desires arbitrated as resources and time permit.

nsibility?

Well that about wraps it up, right? Of course not! Now it's time to "steal" that little bit of extra proficiency from anywhere we can. A top-notch crew cashes in on every opportunity for self-improvement. Let's look at some different possibilities where appreciable gains can be made.

Ever get to the ARCP and find out that your mated receiver/tanker is going to be a little late? How about taking that time to practice emergency gear and flap procedures or getting a little orbital pattern steering lesson in? And remember those vectors to twenty-five mile final on the last pilot pro? Going to a less crowded airfield and getting clearance for visual box patterns for ten-mile finals not only gets you out of the controller's hair, it "makes" fuel and time for those extra approaches most of us would be glad to have.

Alert (groan), the favorite place for us all I'm sure, can be much more than seven days of prison life. As a captive audience we're there anyway, so why not put the time (or some of it at least) to good use? Our crew likes to use the fifteen minutes of daily battery charging time to cover different emergency situations or discuss some aspect of the aircraft systems operation. When was the last time you opened a "blue book" and went over oxygen, fuel, and hydraulic servicing of your aircraft? Another great opportunity for "hands-on" experience — since the maintenance folks have to be out there too. Another useful thing to work on these days would be to practice emergency ground egress from your aircraft. The current trend of ground emergencies within the Command certainly has me motivated!

How about those TDY's? While it's nice to escape to a new environment where most of the paperwork is usually done for you, they do provide the chance for some of our best training! Ok, co-pilot, handle the maintenance effort on our aircraft for the next thirty days. And you navigator, work out our schedule and all the mission details. Boom, the logistics of the mission are yours. Make sure we've got accommodations wherever we go, meal schedules, adequate rest and fuel, and then handle the fuel log and takeoff data for the co-pilot. Get the picture? Absolutely no limit to the possibilities. Incentive flights are even better as they enable a crew to design, develop, and carry out a mission specifically tailored to their needs. Best of all, incentive flights can teach some of our more dependent aircrews to stand on their own feet and take responsibility for the coordination of their mission and training requirements. Most schedulers are more than happy to support incentive flights as they relieve their workload and that of the "home team" maintenance folks to boot!

Flying seminars are also a useful tool. The best way to avoid mistakes is to learn from those of others. Each squadron is a potpourri of experience and seminar sessions on flying techniques, aircraft systems, and the rules by which we fly provide squadron personnel with a chance to interface and share their expertise. A scheduled "down" day complete with buffet lunch and even some cold beer later on in the day can really contribute to a highly successful experience. A carefully planned agenda that is highly relative to the needs and interests of the participants is a must. A questionnaire during the initial planning stages is often useful in selecting topics of the highest interest and concern. Be sure to solicit inputs from your Stan/Eval and maintenance folks.

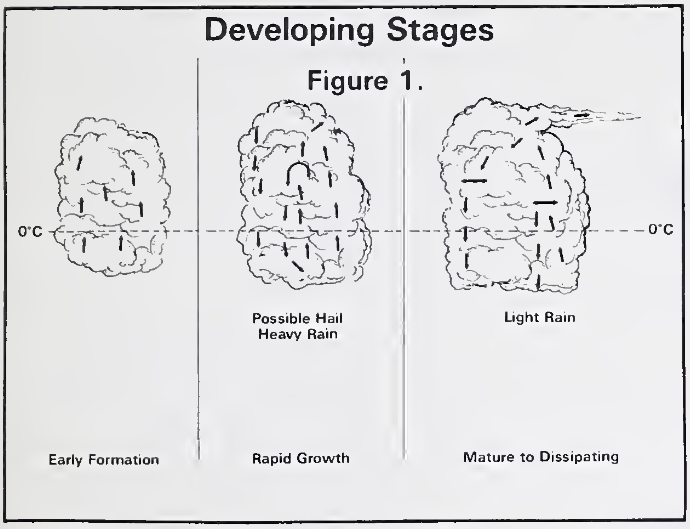
Simulators open up yet another avenue by which to grab a bit of extra proficiency when flights aren't available. How many of you navigators out there have such extraordinary skill that an extra CTD or T-10 simulator wouldn't be worth the effort? And you pilots, even a T-37, T-38, K-135, B-52, or T-39 simulator could help re-establish that impervious crosscheck before the onset of those winter weather days. We must take advantage of our simulator resources to the maximum extent possible. The habit patterns they foster and reinforce are that bit of extra insurance for the day when that one big distraction comes along and we might otherwise forget about a normal checklist item such as putting the gear down. Never happens, does it?

Well, so much for a brief outflow of ideas. Perhaps you've even thought up a few of your own at this point. You should have at least concluded that it takes a complete **team** effort to maintain flying proficiency, and that the heart of that team is you. To be effective in the future we'll have to encourage openmindedness and flexibility within our units through effective communication and a consolidated effort involving our crews, their aircraft commanders, supervisors, schedulers, instructors, and evaluators. Stand up and be counted, the responsibility for your flying proficiency rests with you!

Thunderstorms and the associated tornado are the most hazardous weather phenomenon encountered in aviation. Ample evidence indicates that any thunderstorm has the potential to damage your aircraft if you penetrate its boundaries.

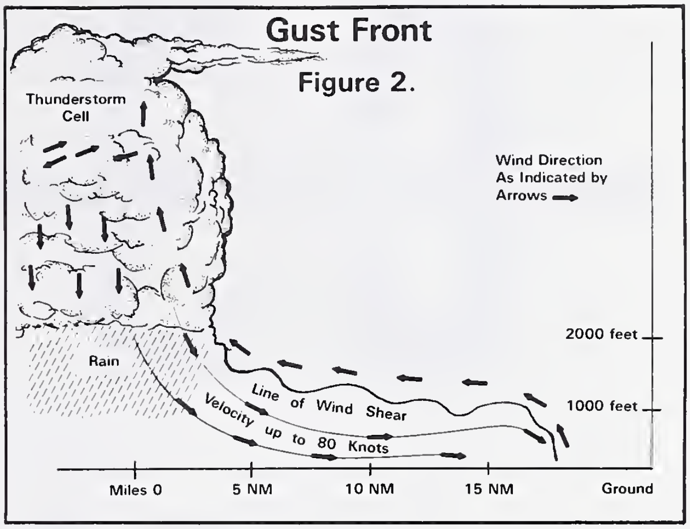
WARNING DANGER AHEAD!

Capt John M. Bruce
644 BMS, K-I Sawyer AFB



Developing Stages

Figure 1.



Gust Front

Figure 2.

The thunderstorm season reaches its peak in May to July, but boomers can occur year around in some parts of the country. The Southeast and Central Plains regions have the worst storms due to the rapid heating of the relatively flat terrain. The location of flight hazards within a thunderstorm, typical intensities, avoidance techniques, and capabilities and limitations in observing and forecasting severe weather are all subjects of interest to USAF aviators.

Severe thunderstorms may consist of many cells in different stages of growth. (Fig 1.) They can extend over distances of up to 50 miles with tops reaching 40 to 60 thousand feet. The updrafts located ahead of the storm act to feed the building storm. These updrafts maintain the life of the system while the downdraft located in the middle to rear of the storm produces the associated gust front. It is the gust front that produces a low level wind shear. (Fig 2).

The mature thunderstorms typically contain updrafts greater than 50 feet per second (3000 fpm) and downdrafts of the same magnitude. Severe storms contain vertical motions in the range from 100 to 150 feet per second (6000 to 9000 fpm). The turbulence associated with these intense storms can result in gust loads on your aircraft ranging from 2-4 Gs and as severe as 6 Gs. Turbulence may be located almost anywhere within the storm. Severe turbulence is normally restricted to the cloud and its immediate vicinity. The worst turbulence outside the storm usually occurs in the clear air downwind. Light to moderate turbulence has frequently been encountered in the clear air around thunderstorms. The intensity of the turbulence is dependent on the stage of storm development. The most severe turbulence is associated with periods of rapid growth.

The gust front is something we encounter at low altitude. It results from the intense downdraft hitting the ground and spreading out ahead of the thunderstorm. This gust front may extend 10-15 miles ahead of the storm with surface winds up to 80 knots. The primary hazard of the gust front is a low level wind shear. Another thunderstorm hazard gaining recognition is the microburst phenomenon, which occurs near the center of the storm. Fundamentally, a microburst is a simple atmospheric flow, basically a downdraft, that spreads out horizontally in a radically divergent flow upon reaching the ground. Traversing a microburst at low altitude, an airplane will encounter increasing headwinds as it enters the microburst, remnants of the downdraft near the center, then increasing tailwinds as it departs the area. According to the National Transportation Safety Board, microbursts were responsible for the crashes of two Boeing 727's. The first occurred at JFK on June 24, 1983 and the second occurred July 9, 1983 at New Orleans International. Both experienced rapidly decreasing headwinds and strong downdrafts near the center of the microburst.

There is currently no capability to accurately measure the low level wind shear associated with the gust front. An important point to remember is that a hazard to your aircraft exists on takeoff and landing up to 20 NM away from the cell. If the cell is that far away there may be no visual indications of the approaching storm.

Hail is usually located in the center of a thunderstorm and initially associated with the updraft which produces it. If the updraft is strong enough, the hail can be lifted to the jet stream level and transported downstream as far as 20 NM. In order to avoid hail, aircraft should avoid a thunderstorm by at least 20 NM at or above 23,000 feet and by at least 10 NM below 23,000 feet.

Lightning occurs at all levels in a thunderstorm, and can also occur cloud to cloud or cloud to ground. Flying below, near or between cells can result in a lightning strike to your aircraft. The greatest number of lightning

cont'd on page 24

C3

THE CUTTING EDGE

SAC Digital Network

Capt Stephen Slate
3901 SMES, Vandenberg AFB

While some of us old crew dogs are still going through the growing pains of coping with the Air Force Satellite Communications System (AFSATCOM) and the 616A modification to the survivable low frequency communications system (SLFCS), the third phase of C3 is just around the corner — i.e., the SAC digital network (SACDIN). This system will replace the current SAC automated communications and control system (SACCS) and more importantly to the crewmember, will also serve as an integrator for the entire C3 system at the Minuteman launch control centers (LCCs).

Replacing the current SACCS with SACDIN will not be as traumatic a change as the 616A modification. The latest technology will be used in SACDIN which will make it extremely user friendly and easier to operate and maintain than the current SACCS. There will be approximately 135 SACDIN sites throughout the United States, including all Minuteman LCCs. Each LCC will then have both transmit and receive capability through the complementary use of a keyboard/visual display unit (VDU) and the existing line printer unit (LPU). The SACDIN transmit procedures will be much simpler than the current SACCS transmit procedures. The operator will simply call up a preformatted message header and type in the appropriate information — address, priority and classification. The text of the message is then typed in, with edit capability, and the message transmitted or stored for transmission later. If a mistake is made, the VDU will notify the operator through an easy to understand error message, e.g. error-invalid address detected. In short, even though SACDIN will be a highly sophisticated communications system, it will be easier to operate than the older SACCS equipment.

A unique feature of SACDIN in its multilevel security processing system. The overall SACDIN system will handle almost all levels of classified information, from unclassified to top secret — ESI. Each terminal will be specifically coded to receive a maximum security classification, so a terminal cleared for a maximum of secret message traffic can neither send nor receive traffic classified at a higher level than secret. Therefore, the extensive use of the SACDIN with these features will make it the largest multilevel secure system in the world.

To the crewmember, the most obvious feature of SACDIN will be its function as the C3 integrator. With this system, all hard copy messages received at the LCC will be printed out at the LPU — and only the LPU! The current plan is to power down the SLFCS teleprinter and to manually switch AFSATCOM messages to the LPU. Additionally, unclassified messages can be transmitted via AFSATCOM using the SACDIN keyboard/VDU. So for the crewmember, SACDIN will result in easing the workload during alerts. There will be fewer SLFCS paper changes or jams, fewer AFSATCOM paper or ribbon changes, and the convenience of receiving hard copy messages at only one work station will become a reality.

The Air Force Operational Test and Evaluation Center (AFOTEC), with the support of SAC operations, communications and maintenance personnel, is now preparing for the initial operational test and evaluation (IOT&E). The IOT&E is scheduled to begin in March 1984. Installation of the SACDIN system is tentatively scheduled to begin in the spring of 1985 at Offutt AFB. After Offutt AFB, the C3 modification for Minuteman LCCs will continue. The SACDIN will provide the only two-way, multilevel secure communications system at each Minuteman LCC, as well as serve as an interface to AFSATCOM and SLFCS. It will be another modification for the crewmember to copy with, but it is a change that will ease the workload during alerts.

WANTED

COMBAT CREW EDITOR

JOB DESCRIPTION: HQ SAC/IGFE Chief, Safety Education Division. Editor of Combat Crew magazine. You also manage the SAC Safety Awards and Recognition Program and are the project officer for the SAC Safety Management Seminar. A one-of-a-kind position.

REQUIREMENTS: Major or senior captain, pilot, journalism background would be beneficial but could substitute strong leadership.

APPLY: Call Maj Randy Lauterbach, AV 271-6221/2620.

WHEN: Plan to arrive at Offutt in mid June.

Battery Switch-Emergency . . .

Capt Michael R. McNeil
376 SW, Kadena AB

Battery Switch-Emergency. The word association is nearly universal for tanker pilots and copilots and probably for most navs and booms, too. We do it automatically before applying external power, we do it before starting engines whether it be an alert exercise or a training mission. The copilot scrambles for it if external power fades out or trips off, and the pilot scrambles for it in the simulator when the cockpit goes dark except for the switched DC bus failure light and copilot's instruments.

We all go for the switch automatically — just as we have been trained to do, but why do we do it in each case? If you're up on your DC system and can answer, then consider yourself to have passed the criterion test, and move on to the next article. If you're just a little hazy on the switchology and the busses, then read on.

Our discussion revolves around the switched DC bus, and specifically, the power source for the switched DC bus.

The switched DC bus (called the essential bus on similar transports) provides us with several "essential" items such as a radio, engine start, and fire detection, so we have more than one way of powering it.

It is normally powered by TR bus #1 (battery switch in normal), but if TR bus #1 loses power, then switched DC bus also loses power, and the switched DC bus failure light comes on. Now comes the conditioned response: battery switch-emergency. Put out the red light, right?

Now the switched DC bus is powered again, but this time from the battery bus. And whence the battery bus? Well, if AC power is still available, the battery charging TR provides the power at 12.5 amps (20 amps for short periods) on the first half of the fleet and at 25 amps for the second half of the fleet. Reduce your DC load and you're all right. It's clever engineering and it works great.

But what if there is no AC power, or the battery charging TR fails? The battery automatically powers the battery bus and hence the switched DC bus. This is still a satisfactory situation — everything works — but we are time-limited by battery life. Now is the time to really consider turning off unnecessary electrical loads and finding a place to land. Remember, though, if the battery fails, there is another just like it back at the APU that you can bring forward, provided your boom or crew chief kept it charged up.

Now let's consider some of the times when we go battery switch-emergency when it really doesn't seem like an emergency at all. How about applying external power? We are cautioned to first go to battery switch-emergency and trip the external power switch. This will trip the external power breaker and allow the airplane's phase sensing relay to function should reverse phase external power be subsequently applied. By going to emergency first, we have the switched DC bus powered both before and after power is applied. The same goes for a loss of external or APU power on the ground. If the battery switch is not in emergency when power drops off the line, the external power breaker will not trip, and the protective devices will not be available if the power comes back up before you can trip the external power switch. That's why the copilot scrambles for the battery switch when the power starts to fade.

How about starting the engines? Well, the switched DC bus has the starter controls and ignition, the oil low pressure warning lights, the fire detection system and the fire switches — all essential for starting. If it's a power-off start (as on alert) it's obvious that we have to go to emergency to power the switched DC bus so we can start. But what about a power-on start? The battery switch is in normal and the switched DC bus is powered prior to start — so can we start it this way? Yes, it will start — as long as you don't lose AC power. If we lost AC power, we would lose starter control, ignition, oil pressure lights, and fire warning — and if it did catch fire we couldn't cut it off with the fire switch.

We eliminate that possibility by going to emergency first. While the engines will start in normal with AC power, you can also fly the whole mission from engine start to shutdown with the battery switch in emergency. I know — don't ask how, but I know.

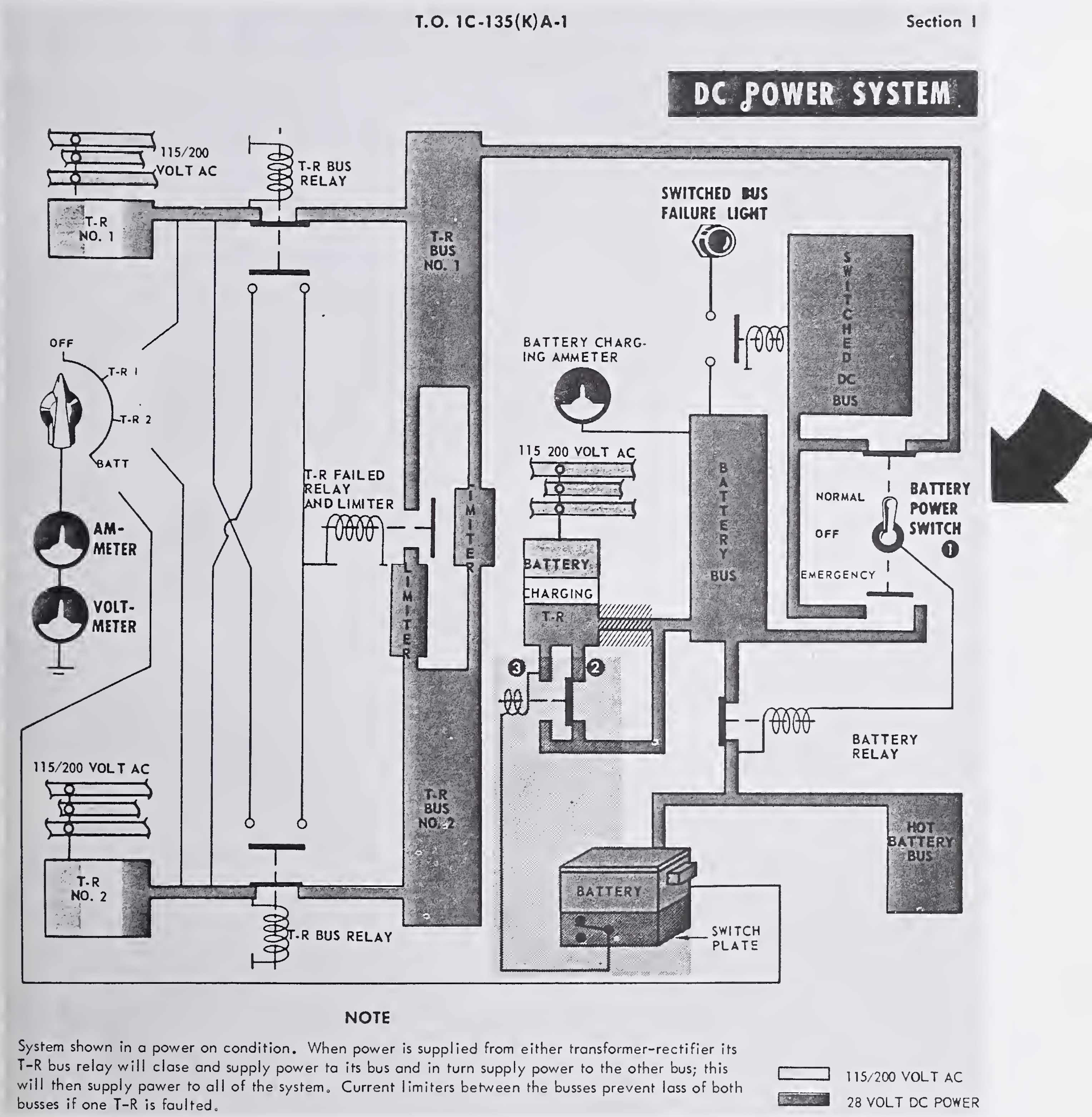
With all of this battery switch-emergency business, we should consider the power available from the battery. We discussed shutting things off in flight, and the same applies on the ground. On a cocked alert bird with a weak battery you may not be able to apply external or APU power. Try shutting off the boom's air refueling master switch and comm one radio. This may free enough power to close the external power breaker. In the same situation, if you turn the battery switch to emergency and the gear warning horn sounds, it may mean you have a low battery. (This is not the same occurrence as described in the Dash One for airplanes 1 through 14). The warning horn usually gives a quick beep as you move the switch down, but a relay closes and keeps the horn from sounding. This relay requires 18 volts to close and keep the horn quiet. Below 18 volts, the relay remains open and the gear warning horn sounds down to 12 volts. This also lets you know you're below starting voltage, because there is a resister in the system to prevent stray voltage from firing a cartridge.

You need 18 volts to overcome this resistance and fire the cartridge.

So now the lesson is over and the test question is: How shall I power my switched DC bus?

Flyers are known to like limericks, so here is one to get you past the test:

The Battery Switch is amazing,
Correct placement keeps eyebrows from raising.
It picks the right source
For the Switched Bus, of course,
And protects us from improper phasing.



T.O. 1C-135(K)A-1 Section I

DC POWER SYSTEM

NOTE

System shown in a power on condition. When power is supplied from either transformer-rectifier its T-R bus relay will close and supply power to its bus and in turn supply power to the other bus; this will then supply power to all of the system. Current limiters between the busses prevent loss of both busses if one T-R is faulted.

☐ 115/200 VOLT AC
▨ 28 VOLT DC POWER

CROSSIFCHECK

IT'S A QUESTION OF JUDGMENT

As aircrew members we are issued nearly everything we need for flight. There are even regulations that outline specific quantities of these items: gloves, nomex, 1 pair; helmet, flying, 1 each, etc. BUT, there's one thing we aren't issued, JUDGMENT. And even if we were, who would decide how much? Who would maintain the account? Would more or less be issued depending on the weather forecast? Sounds ridiculous, right? BUT, evaluators grade it, commanders second guess it, and its adequacy is usually determined only after the fact. Fine, so were **does** judgment come from? We acquire it. We acquire it over time by learning from our experiences and by increasing our knowledge through research or study. We practice the application of it by "what if — ing" situations and by discussing the ultimate consequences of any decision that we might have to make. This is something we can do at groundspeed zero, before we ever get airborne — where the results of poor judgment are not so forgiving. We need to learn all we can about our mission, our aircraft and the environment we fly in. The more knowledge we have increases the odds that our judgment will be sound.

Did you ever wonder where the procedures in AFM 51-37 came from? Did the guys who write 51-37 just wake up one morning and say, "Gee, wouldn't that be neat?" No, not hardly. They used their knowledge of instrument approach design criteria (AFM 55-9), applied judgment, and synthesized procedures that are meant to keep us safe. But what happens when we're confronted by situations that aren't specifically covered in a manual or regulation? We are **expected** to use good judgment, in fact AFM 51-37 says on its first page, "This manual provides adequate guidance for instrument flight under most circumstances, but is not a substitute for sound judgment."

We receive many inquiries about specific instrument procedures or situations, the answers to which are not found in a neat little book. It's not meant to be a "cop out", but sometimes there **is** no one good answer, sometimes "it depends" **is** the right answer. It's a question of judgment. Here are three examples of questions we've received, the answers — depend:

QUESTION

You're flying the arc of a published instrument approach. The arc has an altitude restriction. AFM 51-37 says it's OK to turn and descend to the next segment altitude when you reach your leadpoint. Normally, you roll out on course, but what if you turn at the published leadpoint and still overshoot or you miss your leadpoint altogether? Is it prudent to descend or to continue a descent if your turn point didn't work?

ANSWER

It depends. The most prudent (translates: safest) course of action anytime you question your position is certainly **not** to descend further, less the ground rise up and smite you. In this case though, depending on your aircraft instrumentation, your position orientation and your knowledge of obstacle clearance criteria, you may choose to continue the descent as you re-intercept your desired course. The answer depends on judgment, and judgment depends on knowledge and experience. If you are sure of your position, remember that instrument approach design criteria provides maximum obstacle clearance when you're on the course centerline. However, any time you're **unsure** of your position, you should consider climbing immediately to the minimum safe altitude or emergency safe altitude.

QUESTION

You're being radar vectored to the ILS/DME RWY XX, for an ILS final and are informed that the TACAN (translates: DME) has just gone down. What do you do?

ANSWER

It depends. If the final approach fix for the localizer portion is identified only by DME, you have two choices. If missed approach considerations are not a factor, i.e., you don't mind going around if you lose the glide slope signal, press on and don't deviate very much from the glideslope. However, if you need to get it on the ground on this approach, either from a DH or an MDA, then you'd better request a PAR, ASR or something else. The answer here depends on your situation.

QUESTION

You plan to fly an instrument approach. The navigation aids required to fly the initial, intermediate and final segments are compatible with your aircraft's equipment, but the missed approach segment requires equipment you don't have. What should you do?

ANSWER

It depends. AFM 51-37 says to ". . . make other missed approach arrangements with ATC prior to the IAF . . ." Depending on how great your need is to fly that particular procedure, or on how many radios you have available, etc. (translates — what's the worst thing that could happen to you should Murphy make an unexpected appearance?) you may or may not choose to fly that approach.

So you see, some questions don't have a single "right" answer, other than "it depends." Most flying directives are written to provide general procedures that are prudent for most circumstances. We don't want the "staff" to build "procedural monsters" that legislate judgment and inadequately attempt to substitute rules for knowledge. Instrument flying, as in any other type of flying, requires pilots to exercise judgment. The quality of our judgment depends upon our experience and our knowledge. If you're short on one or the other — play it safe. If you're short on both — you shouldn't fly airplanes.

SIFC AV 347-4571.

CELL AND MITO ARE NOT FOUR-LETTER WORDS

Capt J. J. Deuel
97 AREFS
Blytheville AFB, AR

Have you ever noticed that the moans and groans of the crews checking next week's schedule are directly proportional to their cell position? Throw in a MITO LEAD and the screams of anguish are exceeded only by the guy who was just told that upstate New York is a southern assignment and now he's going north.

If being number two in a four-ship cell fills you with dread in Base-Ops; how does arriving at the hammerhead as lead of a three-ship grab you? I dare say a flight surgeon would ground 50 percent of the crew given a blood pressure check in this circumstance. Of course you planned for this eventuality and took copious notes at the briefing so you can hack it — Right? Let's see, what was that interplane frequency?

Rule #1: Plan your mission for any cell position as if you were lead. Not only will it enable you to move up smoothly if lead aborts, but prove invaluable to your own understanding of the mission. If you catch yourself wondering why lead said or did something you can bet you broke rule #1. Let me state unequivocally that I am not advocating that you try and be lead from any other cell position. Nobody likes a back seat driver, but if you know the plan intimately and are listening up on the radios you can anticipate changes and deviations before lead calls for them. By all means speak up if you see something unsafe or if lead obviously misses something.

Rule #2: If all else fails follow directions. SACR 55-11 contains just five items each for Lead and Wing responsibilities. Lead must:

1. Brief — make it good and ensure it's understood.
2. Direct deviations as necessary ensuring they are coordinated and understood **BEFORE** any action is taken.
3. Remember it is easier to follow a good platform.
4. Be aware of the position and performance of all flight members.
5. Be aware that increased performance of 135E/R and KC-10 aircraft require additional consideration in a mixed force cell.

Wingmen must:

1. Keep lead in visual or electronic contact at all times.
2. Maintain briefed position.
3. Anticipate corrections and plan ahead (see rule #1).
4. Monitor all aspects of the formation and advise lead if an unsafe condition is noted (see rule #1).
5. Be prepared to assume lead (see rule #1).

We're not required to be EAGLE Scouts to fly formation, just act like one and **BE PREPARED.**

MITO training gives everyone an extra rush of adrenalin. First they warn us about wake turbulence, then they teach us to avoid it, then they order us to deliberately follow a 400,000 pound BUFF with a 30-second interval. You would think they were trying to get us to volunteer for the Command Post till you notice that everyone has to do it. Remember MITO procedures are designed to achieve maximum runway saturation during EWO when speed of departure is paramount. It is not inherently dangerous but if you know a pilot that has never been scared during a MITO you know one who either has golden hands and feet or a lead brain.

Awareness is the key to a good safe MITO as indicated by SACR 55-11, #1 rule for ground and flight training. Brief thoroughly. Charging into a cloud of black smoke 30 seconds behind the bombers is not the time to ask questions. Know your procedures and use them. Do not let someone else talk you into a corner and don't let yourself be lulled into one. War stories abound on the subject of close calls and tragedies. Do yourself and your crew a big favor and learn from them.

Aircraft Maintenance

Sgt Robert L. Babcock, 28 BMW, Ellsworth AFB, is SAC Maintenance Airman of the Month. A metals processing working leader in the welding shop, fabrication branch, Sgt Babcock recently proved his value to the 28 BMW by accomplishing depot-level repairs on B-52 tow bars. By coordinating with the depot and receiving permission to do the job on station, Sgt Babcock saved the Air Force approximately $80,000 and 160 man-hours of labor in one year. On his own initiative, Sgt Babcock designed and manufactured a pallet for the transportation of high pressure gas cylinders to and from base supply. The new pallet eliminates very hazardous conditions each time cylinders are transported. An experimental nature and aggressive attitude are two traits necessary to consistently improve maintenance efficiently. Sgt Babcock continually demonstrates these traits as SAC's Maintenance Airman of the Month.

Missile Maintenance

SSgt Dana D. McMillion, 91 SMW, Minot AFB, is SAC ICBM Airman of the Month. Assigned to the Periodic Maintenance Team Section, Sgt McMillion is responsive to unique maintenance problems. He recently volunteered his off duty time to dispatch to a site with a "B" plug lockout. After six hours of troubleshooting he successfully opened the lock. This persistent effort saved the Air Force thousands of dollars in equipment and manpower. At a remote launch facility, Sgt McMillion performed an emergency shutdown due to a fire on site. His alert actions not only saved thousands of dollars in equipment, but also allowed a timely restoration of a sortie back to Strategic Alert. An exceptional manager of resources, Sgt McMillion has effectively worked the limiting factors of low technician experience and equipment availability to insure priority maintenance required at launch control/launch facilities is accomplished.

PROFESSIONAL PERFORMERS

Flying Crew

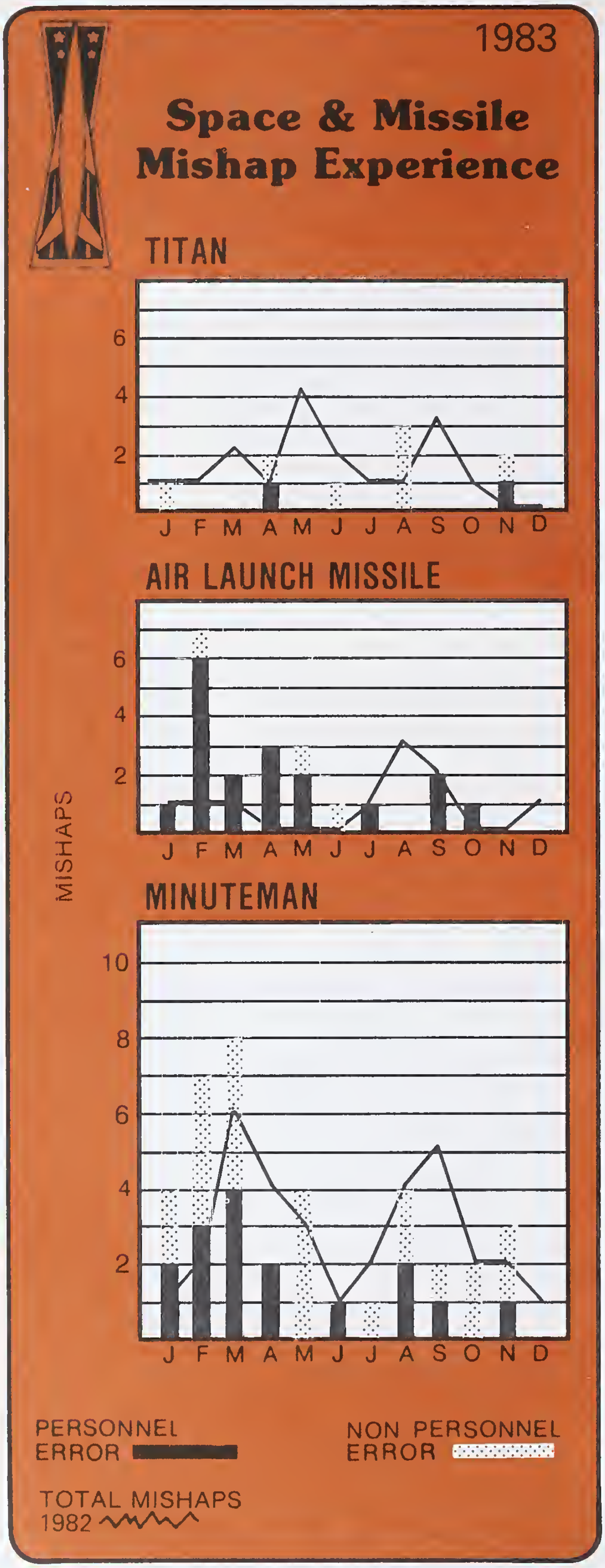
Photo by A1C Melanie Bear

Capt Mark Pestana, CP; Maj Ben Pena, R3; Lt Mike Doody, R-1; Capt Greg Davis, R2; Lt Chuck Wheeler, N2; Capt Carl Cox, R5; Maj Tom Petersen, N1. (Not pictured: AC Capt Chris Hoffman, RCC Maj Al Feldkamp, R3 Capt Jim Brennan, R4 Lt Grady Eakin, IMT SSgt Bob Seastrom, and IMT Sgt Jim Schweikert.)

An RC-135U Combat Sent aircraft from 55 SRW, Offutt AFB was recently returning from an operational reconnaissance mission which included a takeoff from RAF Mildenhall, two air refuelings and several hours of reconnaissance "on watch" time. Eight hours into the mission the copilot, Capt Mark Pestana, noticed that the number one fuel flow indicator had pegged. At first, the pilot, Capt Chris Hoffman, thought the gauge was inoperative, but a crosscheck of other engine instruments, a visual scan of the number one engine from the window, and a confirmation by the Ravens revealed a contrail on the engine where there was none on the other three. Fuel appeared to be rapidly escaping from around the engine and a massive fuel leak was suspected. The engine was shut down but fuel still continued to flow. Capt Hoffman ordered that fuel be transferred from the number one main tank to the aft body tank. After the main tank was drained to empty, the forward body fuel tank also emptied, for unexplained reasons. The fuel leak finally stopped. Headwinds for the 2000 mile overwater flight back to RAF Mildenhall were much higher than predicted. The pilots flew optimum, three engine altitude and airspeeds to save fuel while the nav team, Capt Tom Petersen and 1Lt Chuck Wheeler, did their part by determining the shortest route back. As it became clear that return to Mildenhall was impossible due to fuel shortage a suitable alternate was requested. RAF Lossiemouth, the closest air base in Scotland, was closed for runway repairs. That left RAF Leuchers near St. Andrews, Scotland, as an alternate. The weather at RAF Leuchers had a ceiling of 1200 feet with poor visibility due to rain showers. The runway was wet, there were high gusting winds, and the three engine approach and landing would be made at dusk on a short runway and at an airfield unfamiliar to the pilots. However, a successful ILS approach was flown. On landing, about 6900 lbs of fuel remained — enough to fly an additional 200 miles. The fuel leak was traced to a completely broken fuel line on the outside of the engine. Exceptional flying and excellent crew discipline saved an extremely valuable reconnaissance aircraft and aircrew.

Missile Crew

Crew E-080, consisting of 1Lt Rodney K. Robison, MCCC; 2Lt Gregg B. Anderson, DMCCC; SSgt Jimmie G. Sharp, MSAT; and Sgt Charles J. Powell, Jr., MFT, 308 SMW, Little Rock AFB, is SAC's Missile Crew of the Month. Crew E-080 demonstrated their superior weapon knowledge, safety consciousness and poise under extreme pressure during recent propellant transfer system (PTS) operations and SAC IG evaluation at their complex. Immediately after initiation of Cat I PTS operations, the crew experienced a MSA malfunction requiring a safety hold. After withdrawing maintenance, the crew troubleshot the failed fuel pump, assisted in obtaining a helicopter dispatched with a team who corrected the malfunction, allowing the operation to continue safely. Throughout the prolonged alert the crew flawlessly eliminated dangerous malfunctions and delay. On the following alert, during performance of weapon system testing at the direction of the SAC IG and while supporting the deployed alternate battle staff at their site, the crew experienced a malfunctioning diesel and silo blast valve during a launch verification. Crew coordination quickly alleviated all failures, resulting in complex systems being rated effective/operational. The SAC IG operations team chief cited crew actions as "the most proficient and professional observed." Sustained outstanding performance during the ORI resulted in praise for the crew and "Professional Performer" designation for the MFT.


1983

Space & Missile Mishap Experience

TITAN

AIR LAUNCH MISSILE

MINUTEMAN

cont'd from page 15

strikes occur between the temperature range of −5°C to +5°C. The altitudes vary from the surface to 20,000 feet.

When an aircraft fuel tank is only partially filled, the space above the liquid fuel is filled with a moisture of vaporized fuel and air. The proper ratio of fuel and air is, of course, a highly explosive mixture. JP-4 is the most explosive fuel used in the altitude/temperature range where lightning most frequently occurs.

Older aircraft which contained all-aluminum skins acted as single Faraday Cell dissipators, which permitted the built up electrostatic charges to be conducted from the nose to the tail of the aircraft where it was leaked off. The static problem has reportedly been engineered out of the B-1 airframe.

Weather radar is very valuable in forecasting and avoiding thunderstorms, but it has some important limitations you should be aware of. Weather radar does not have the capability to measure the hail content, the intensity of the updrafts and downdrafts and can be attenuated greatly in heavy storms. Weather forecasters use the following figures when they forecast thunderstorms coverage:

Isolated	1-2%
Few	3-15%
Scattered	16-46%
Numerous	greater than 45%

Military weather advisories are issued every three hours with the following color codes:

Orange — storms with gusts less than 35 knots and any hail present is less than ½ inch in diameter
Green — moderate storms with gusts 35-49 knots and hail ½ to less than ¾ inch in diameter
Blue — severe storms with gusts 50 knots or greater and hail ¾ inch or greater.
Red — tornadoes

In addition, each base weather station issues specific watches and warnings for its base.

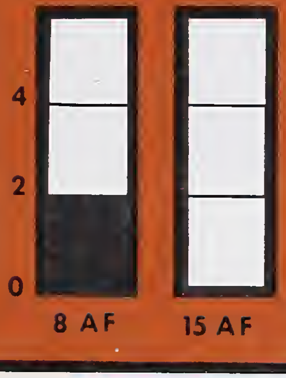
With the exception of Kansas City Center, ARTCC radar is engineered not to identify weather cells. Kansas City has a meteorologist on duty 24 hours a day but it is the only one.

For information about storms, PMSV is the best source of contact. These people have weather detection radar and devote their time to tracking storms. Airborne radar in a B-52 is ca-

SAC'S TEN YEAR FLYING SAFETY RECORD

CLASS A FLIGHT MISHAPS

YEAR	73	74	75	76	77	78	79	80	81	82	83
TOTAL MISHAPS	5	8	4	4	4	1	5	4	4	2	2
FLYING HOURS 100,000	6.1	5.1	4.2	3.9	3.7	3.6	3.6	3.4	3.5	3.5	3.3
FATALITIES	0	14	7	22	10	5	7	2	14	9	7
RATE	.82	1.6	1.0	1.0	1.1	.28	1.4	1.2	1.2	.58	.61



23081

DEC FLYING HOURS

325670

1983 FLYING HOURS

APRIL JUNE	B-52G FB-111A

1983 MISHAP STATS

pable of identifying thunderstorms. At altitude any storm that casts a shadow should be given a wide distance. The tricky ones are the heavy rainshowers that don't cast a shadow. Thunderstorms growth rates vary considerably and growth rates of well over 5000 fpm have been measured. Extreme caution should be used before attempting to penetrate a heavy rainshower — it might be a baby thunderstorm.

Assume you are at FL 310 and cruising at 420 knots when you detect what appears as a heavy rainshower 40 miles ahead. It is actually a thunderstorm with its tops at 20,000 feet. In two minutes you are 26 miles away and the thunderstorm's top is 40,000 feet and you have no placed to go. The key to solving this problem is to fly around any weather so as to avoid getting yourself into that box in the first place.

Because we have more restrictive rules than the civilian pilots, we are force to give severe weather a wider berth. Civilians and commercial airliners in particular seem to fly very close to thunderstorms if not through them. Because of this, sometimes ARTCC does not seem to understand why SAC aircraft deviate 50 or 60 miles off course while all the other traffic continues on course.

Radar tilt control can be used to help detect the building thunderstorms. This is especially true at low level so come out of TA mode and get a good picture of the weather ahead of your aircraft. The hardest cells to distinguish are at low level in the mountains as you already expect to see a shadow in the area. If the shadow moves, that's a dead giveaway, but you may not have that much time. The cell should have a fuzzy edge instead of a definite edge like a terrain return. To avoid embarrassment, plot a suspected isolated storm to ensure it is not a cultural return.

Heavy rain can mask thunderstorms behind it by absorbing the radar energy. Be safe, always assume the rainshower on the scope is the leading edge of a thunderstorm until proven otherwise.

Thunderstorms are extremely unforgiving. If you ever fly through or are close to one and live to tell about it, you can sit and talk to your heart's content on alert about the one that almost got you. What a great story that would make. Use some common sense and give all thunderstorms a wide berth. Remember the cell itself is only one aspect of a thunderstorm. Be smart enough to stay away from the cell, and the worst threat to us will be the gust front and its associated turbulence. **Fly Safe!**

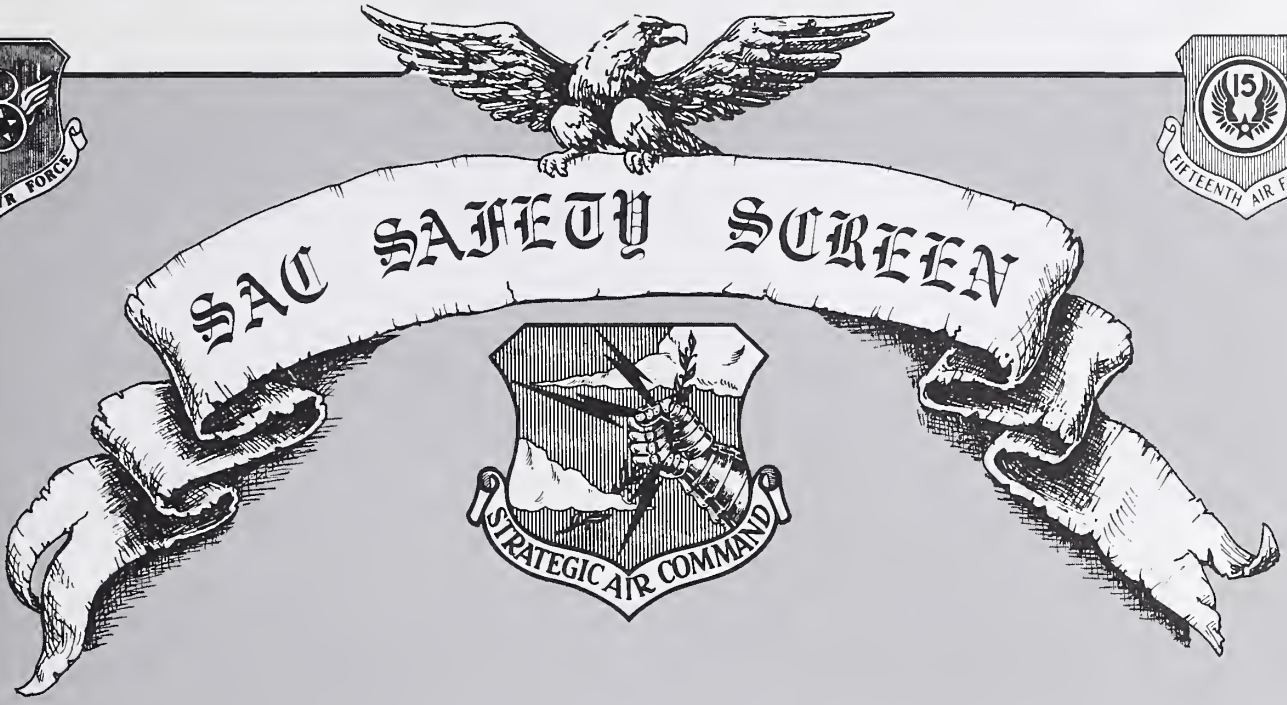
Well Done!

On 27 July 83, Capt Balzli was the pilot on a U-2CT functional check flight flown from Beale. All preflight checks, including an elevator trim tab test, were performed as required by the FCF checklist. The proper takeoff trim position was confirmed by the cockpit trim indicator prior to brake release. Capt Balzli had no indication of impending trim failure. Takeoff roll and initial climb were normal. At approximately 100 feet AGL the pitch trim started to run away in the nose up direction. The aircraft was rapidly accelerating and was close to its normal climb pitch of 60 to 70 degrees. The forces required by the pilot to keep the yoke forward and prevent the aircraft from stalling or looping onto its back were extreme. Capt Balzli turned the pitch trim off by removing electrical power from the trim system. This did not stop the trim and it continued to run to the full nose up position of 30 degrees. At the same time he rolled the aircraft into a left bank, reduced power to idle and started the flaps down. This significantly reduced the control pressures, but with the power at idle it still required considerable forward yoke to keep the nose tracking down and prevent a violent stall.

Capt Balzli was rapidly becoming exhausted. He wedged his right knee on the control column to hold the yoke forward and was able to maintain sufficient control of the aircraft. With the airspeed down to landing speed plus ten knots and the aircraft in level flight, he was able to remove his knee from the control column and used both hands to maintain yoke pressure. The FCF had required an aircraft performance check above 60,000 feet so Capt Balzli was wearing a pressure suit. Due to the cumbersome nature of the suit, the confined space of the cockpit, and lack of suit cooling or vent due to engine idle operation, Capt Balzli was rapidly becoming overheated and fatigued from the excessive control forces. His arms were beginning to shake from his sustained efforts.

Having recovered the aircraft to level flight, Capt Balzli considered a controlled bail out. Instead, he decided to try to land. If landing proved impossible, his only option would be to eject. Normal landing nose up trim is six units. In this case Capt Balzli was fighting control loads caused by trim in excess of 20 degrees nose up. He maneuvered the aircraft to a three mile final and by reducing power was able to start the nose down and intercept a reasonable glide slope. The forward control pressures precluded any prolonged flare. Capt Balzli "skipped" the aircraft to about a foot then settled in for an uneventful landing.

A miswired motor was the cause of the runaway trim condition and the reason the cut out switch did not stop the movement. The superb airmanship and calm reactions of Capt Balzli resulted in the successful recovery of a valuable national asset. **Well Done.**



SAC SAFETY SCREEN

60 BMS, Andersen Crew R-135: AC Capt William M Seaton, CP 1Lt Primo Acoba Jr, RN Capt Michael A K Kim, N 1Lt Robert E Lindner, EWO 1Lt Randy T Connors, ADG SrA Donald R Ford

46 BMW, Grand Forks Crew E-12: P Capt Keith P Hrebenak, CP Capt David C Gilday, IRN Capt Joseph J Poznik, N 1Lt Jeffrey S Eisenstein, EW 1Lt Thomas B Thompson, G Sgt Daniel A Debellis

46 BMS, Grand Forks Crew R-16: P Capt Mark A Estep, CP 1Lt Arthur C Close Jr, RN Capt Thomas R Kostuch, N 1Lt Timothy N Travis, EW 1Lt Grelon B Williams, G SrA Jay T Reznecheck

905 AREFS, Grand Forks Crew E-125: IP Capt Michael R Terry, CP 1Lt Charles B Tubbs, IN 1Lt Kenneth A Ortman, BO Sgt Jeffrey S Harp

4 ACCS, Ellsworth Crew R-103P: AC Capt Tom Jackson, CP 1Lt Tim Fallon, N 1Lt John Schulte, BO TSgt Ed Mang, OC Maj Bruce Gilbert, EA NCO Sgt Ron Lauallen, FS NCO TSgt Bill Havens, Intel Planner Maj Paul Alexander, Intel Planner Capt Ivan Jolin, OP Maj Tom Cook, Log Planner Capt Brian Mosely, Log NCO MSgt Bob Elliot, MCCCA Maj Jim Walker, DMCCCA Capt Scott Weaver, Comm Sys Op SSgt Phil Jones, Comm Sys Op SSgt Bob Rogers, Comm Sys Op SrA Carrie Quirion

28 AREFS, Ellsworth: AC Maj Lloyd W Mansfield, CP 2Lt Patrick C Lewis, N 1Lt Robert A Doolittle, BO A1C Stephen L Chatnick

906 AREFS, Minot Crew R-106: P Capt Robert L Gerhardt, CP 1Lt Michael J Raszka, IN Capt Michael A Kowalski, BO SSgt Richard J Cohoon

23 BMS, Minot Crew E-22: P Capt Paul S Castle, CP Lt Russell Severino, RN Capt Robert Shearer, IN Lt John J Slavoski, EW Lt Tim Young, G A1C Jim Waldron

912 AREFS, Robins Crew E-130: P Maj Tom Johnson, CP Capt Richard Whitfield, N 1Lt Debra Dubbe, BO SSgt Kevin Metz

99 AREFS, Robins Crew E-174: P Capt Larry Karl, CP 2Lt Keith Gentile, N Capt Stephen Hamilton, BO SSgt Sze Tom

911 AREFS, Seymour Johnson Crew E-114: P Capt Marc D Felman, CP 1Lt Mark L Blanchard, N 1Lt Christopher D Campbell, BO A1C David A Pileski

911 AREFS, Seymour Johnson Crew R-106: P Capt Craig W Soderquist, CP 1Lt Stephen D Woodward, IN Capt David K Meinhart, IN 1Lt Geoffrey M Horan, BO Sgt Jeffrey P Sargent

97 AREFS, Blytheville Crew E-105: P Capt James W Pzinski, CP 1Lt Stephen Wolborsky, N Capt Harry J Davis II, BO SSgt Jeffrey Boutwell

97 AREFS, Blytheville Crew R-108: P Maj Richard G Ines, CP 1Lt Barbara Chapman, N 2Lt Ector Shepard, BO SSgt Robert Mayeaux

340 BMS, Blytheville Crew R-10: P Capt Benjamin H Barnard, CP Capt Scott E Davison, RN Capt Steven A Chabolla, N 1Lt Stephen K Draper, EWO Capt Robert S Glenn, G SSgt Randall R Stewart

340 BMS, Blytheville Crew E-32: P Capt Roland M Sasscer, CP Capt Donald R Farmer, RN Capt Darrell N Hnizdor, N 1Lt David B Mayer, EWO Capt John W Moore, G SSgt Howard A Verret Jr

668 BMS, Griffiss Crew E-32: P Capt Daniel L McFarland, CP 1Lt Norman E Taylor, RN Capt Paul E Cusac, NN 2Lt Dirck K Saltzgaber, NE 1Lt Michael R Moeller, AG A1C Charles N Follen

41 AREFS, Griffis Crew R-109: P Capt Peter C Fortesque, CP 2Lt James C Harris, NN 1Lt Daniel S Yinger, BO SSgt Peter E Jackson

9 SRW, Beale Crew R-162: P Capt Edward J Dubicki, CP 1Lt James A Ford, N 1Lt Brian D Erts, BO Sgt David A Pye

9 SRW, Beale Crew E-164: P Capt Paul J Napoletano, CP 1Lt James L Thompson, N Capt Leroy Both, BO A1C Michael D Davis

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